UNITED STATES PATENT AND TRADEMARK OFFICE

APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/720,629	11/24/2003	Preston F. Crow	EMC-99-027DIV1	4258

			EXAMINER
24227	7590	06/29/2004	LY, ANH

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ART UNIT	PAPER NUMBER
2172	

DATE MAILED: 06/29/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

	Application No.	Applicant(s)
Office Action Summary	10/720,629	CROW ET AL.
	Examiner	**Art Unit**	
	Anh Ly	2172	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE <u>3</u> MONTH(S) FROM
THE MAILING DATE OF THIS COMMUNICATION.
- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
  Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on <u>24 November 2003</u>.

2a)☐ This action is **FINAL**.   2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) <u>16-25</u> is/are pending in the application.

    4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) <u>16-25</u> is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

    Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

    Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a)☐ All   b)☐ Some * c)☐ None of:

      1.☐ Certified copies of the priority documents have been received.

      2.☐ Certified copies of the priority documents have been received in Application No. _____.

      3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

    * See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1)☒ Notice of References Cited (PTO-892)

2)☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)

3)☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
    Paper No(s)/Mail Date _____.

4)☐ Interview Summary (PTO-413)
    Paper No(s)/Mail Date. _____.

5)☐ Notice of Informal Patent Application (PTO-152)

6)☐ Other: _____.

DETAILED ACTION

1.   This Office Action is response to Applicants' Preliminary Amendment filed on 11/24/2003.

2.   Claims 1-15 have been cancelled.

3.   Claims 16-25 have been added.

4.   Claims 16-25 are pending in this application.

Claim Rejections - 35 USC § 103

5.   The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

6.   This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to

consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g)

prior art under 35 U.S.C. 103(a).

7.   Claims 16-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over

US Patent No. 6,697,846 issued to Soltis in view of US Patent No. 4,761,737 issued to

Duvall et al. (hereinafter Duvall).

With respect to claim 1, Soltis teaches a memory storage system assigning an

inode to each file, each inode adapted to store extents having a field to point to a logical

volume (the name space consisting of Inode containing metadata including file name,

and within the Inode data will be pointers to each of physical addresses for blocks,

forming an extent, and an appropriate flag would be set in the various Inode blocks: col.

10, lines 52-67 and col. 11, lines 1-65; also col. 2, lines 5-32 and col. 7, lines 23-35).

Soltis teaches shared file system over a distributed network in the shared storage

distributed files systems and file system layer and accessing storage from at least two

different host computers having different operating system, and using a logical to

physical mapping of the user data blocks to read the user data blocks, that is,

translation address from logical to physical location (col. 2, lines 38-67, col. 3, lines 38-

67 and col. 5, lines 5-60) and setting an indirect storage flag to write, identify and

access the user data blocks (col. 10, lines 15-65). Also, Soltis teaches UNIX file system

accesses user data, creates inode and data files, identifies the corresponding indirectly

stored data blocks, and accesses the indirectly stored data blocks using indirect

addresses (col. 5, lines 5-60), I-node data blocks containing user data that may not be

located on the same storage device or disk drive, but can be located on different

storage device or disk drives within the same mass storage system (abstract and col. 10, lines 15-65). Soltis does not explicitly teaches having devices organized in physical data blocks for physical storage of data and at least one processor including an operating system having an extent based file system for abstracting file names to the physical data blocks in the devices and at least two of the extents being direct extents indicating a logical volume containing data blocks, a first direct extent pointing to first data blocks in the data storage devices and a second direct extent pointing to second data blocks in the data storage devices, the first direct extent indicating a different logical volume than a second direct extent.

However, Duvall teaches UNIX file system residing on mass storage devices including a plurality of sequence of blocks, which compose the file system as physical data blocks for the storage devices (col. 2, lines 46-61 and col. 4, lines 53-67) and system's processor or microprocessor (col. 3, lines 57-67 and col. 4, lines 28-41) and direct inode contains up to ten block of addresses and level of blocks (col. 2, lines 62-67 and col. 3, lines 1-6).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Soltis with the teachings of Duvall so as to have a system having multiple of storage devices and a plurality of processors for each operating system or file system in a UNIX operating system. The motivation being to have a multiple of storage devices having a plurality of UNIX based file systems for easing or more flexible for extending the data file and enabling to access the same copy of user data without the need for special operating systems.

With respect to claims 17-19, Soltis discloses a memory storage system as discussed in claim 16.

Soltis teaches shared file system over a distributed network in the shared storage distributed files systems and file system layer and accessing storage from at least two different host computers having different operating system, and using a logical to physical mapping of the user data blocks to read the user data blocks, that is, translation address from logical to physical location (col. 2, lines 38-67, col. 3, lines 38-67 and col. 5, lines 5-60) and setting an indirect storage flag to write, identify and access the user data blocks (col. 10, lines 15-65). Also, Soltis teaches UNIX file system accesses user data, creates inode and data files, identifies the corresponding indirectly stored data blocks, and accesses the indirectly stored data blocks using indirect addresses (col. 5, lines 5-60), I-node data blocks containing user data that may not be located on the same storage device or disk drive, but can be located on different storage device or disk drives within the same mass storage system (abstract and col. 10, lines 15-65). Soltis does not explicitly teaches at least one indirect extent pointing to third data blocks storing a third direct extent, wherein each extent further includes a field to indicate whether the extent points to a block of extents or a block of data, wherein each extent comprises a start address field and a length field, the start address field including a pointer to a logical volume portion and a pointer to a data block in the logical volume, and the length field fixing the number of consecutive data blocks pointed to by the extent.

However, Duvall teaches mapping disk block, the segment start address of the map (col. 6, lines 40-50; also see col. 16, lines 55-67) and the length of a segment (col. 19, lines 17-40 and col. 17, lines 47-52) and field for segment of the mapped file (col. 18, lines 6-20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Soltis with the teachings of Duvall so as to have staring address of a mapped file and length of the file offset and a system having multiple of storage device and a plurality of processors for each operating system or file system in a UNIX operating system. The motivation being to have a multiple of storage devices having a plurality of UNIX based file systems for easing or more flexible for extending the data file and enabling to access the same copy of user data without the need for special operating systems.

With respect to claim 20, Soltis teaches the operating system being a UNIX based system (col. 5, lines 5-60).

With respect to claim 21, Soltis teaches a global cache memory (caching the data in solid-state memory for quick recall: col. 4, lines 54-65 and col. 4, lines 4-16; also see col. 1, lines 48-57),

assigning an inode to each file, each inode adapted to store extents having a field to point to a logical volume, at least two of the extents being direct extents indicating a logical volume containing data blocks, a first direct extent pointing to first data blocks in the plurality of data storage devices and a second direct extent pointing to second data blocks in the plurality of data storage devices, the first direct extent

indicating a different logical volume than a second direct extent, at least one extent being written to the third physical data blocks, the at least one extent pointing to fourth physical data blocks; each of the first, second and fourth data blocks storing a segment of the file (the name space consisting of Inode containing metadata including file name, and within the Inode data will be pointers to each of physical addresses for blocks, forming an extent, and an appropriate flag would be set in the various Inode blocks: col. 10, lines 52-67 and col. 11, lines 1-65; also col. 2, lines 5-32 and col. 7, lines 23-35; logical volume from storage devices: col. 10, lines 15-22, and physical of data blocks col. 10, lines 35-67, col. 11, lines 1-13; also see col. 14, lines 25-50 and col. 2, lines 5-21; segments of files; col. 18, lines 40-55 and col. 10, lines 35-50).

Soltis teaches shared file system over a distributed network in the shared storage distributed files systems and file system layer and accessing storage from at least two different host computers having different operating system, and using a logical to physical mapping of the user data blocks to read the user data blocks, that is, translation address from logical to physical location (col. 2, lines 38-67, col. 3, lines 38-67 and col. 5, lines 5-60) and setting an indirect storage flag to write, identify and access the user data blocks (col. 10, lines 15-65). Also, Soltis teaches UNIX file system accesses user data, creates inode and data files, identifies the corresponding indirectly stored data blocks, and accesses the indirectly stored data blocks using indirect addresses (col. 5, lines 5-60), I-node data blocks containing user data that may not be located on the same storage device or disk drive, but can be located on different storage device or disk drives within the same mass storage system (abstract and col.

10, lines 15-65). Soltis does not explicitly teaches a plurality of processors, each processor having a local memory for storing an operating system, a plurality of data storage devices coupled to the global cache memory, the devices and processors capable of communicating by posting messages to each other in the cache memory, each of the devices including a processor and local memory storing an operating system, each operating system having an extent based file system for abstracting file names to physical data blocks in the devices and   by, 'having devices organized in physical data blocks for physical storage of data and at least one processor including an operating system having an extent based file system for abstracting file names to the physical data blocks in the devices and at least two of the extents being direct extents indicating a logical volume containing data blocks, a first direct extent pointing to first data blocks in the data storage devices and a second direct extent pointing to second data blocks in the data storage devices, the first direct extent indicating a different logical volume than a second direct extent and an indirect extent being inserted in the inode between the first and second direct extents, the indirect extent pointing to third physical data blocks in the data storage devices.

However, Duvall teaches UNIX file system residing on mass storage devices including a plurality of sequence of blocks, which compose the file system as physical data blocks for the storage devices (col. 2, lines 46-61 and col. 4, lines 53-67) and system's processor or microprocessor (col. 3, lines 57-67 and col. 4, lines 28-41) and direct inode contains up to ten block of addresses and level of blocks (col. 2, lines 62-67 and col. 3, lines 1-6).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Soltis with the teachings of Duvall so as to have a system having cache memory, multiple of storage devices and a plurality of processors for each operating system or file system in a UNIX operating system. The motivation being to have a multiple of storage devices having a plurality of UNIX based file systems for easing or more flexible for extending the data file and enabling to access the same copy of user data without the need for special operating systems.

With respect to claims 22--24, Soltis discloses a memory storage system as discussed in claim 21.

Soltis teaches shared file system over a distributed network in the shared storage distributed files systems and file system layer and accessing storage from at least two different host computers having different operating system, and using a logical to physical mapping of the user data blocks to read the user data blocks, that is, translation address from logical to physical location (col. 2, lines 38-67, col. 3, lines 38-67 and col. 5, lines 5-60) and setting an indirect storage flag to write, identify and access the user data blocks (col. 10, lines 15-65). Also, Soltis teaches UNIX file system accesses user data, creates inode and data files, identifies the corresponding indirectly stored data blocks, and accesses the indirectly stored data blocks using indirect addresses (col. 5, lines 5-60), I-node data blocks containing user data that may not be located on the same storage device or disk drive, but can be located on different storage device or disk drives within the same mass storage system (abstract and col.

10, lines 15-65). Soltis does not explicitly teaches wherein each extent further includes a field to indicate whether the extent points to a block of extents or a block of data, wherein each extent comprises a start address field and a length field, the start address field including a pointer to a logical volume portion and a pointer to a data block in the logical volume; and, the length field fixing the number of consecutive data blocks pointed to by the extent and wherein each extent comprises a start address field and a length field, the start address field including a pointer to a logical volume portion and a pointer to a data block in the logical volume; and the length field fixing the number of consecutive data blocks pointed to by the extent.

However, Duvall teaches mapping disk block, the segment start address of the map (col. 6, lines 40-50; also see col. 16, lines 55-67) and the length of a segment (col. 19, lines 17-40 and col. 17, lines 47-52) and field for segment of the mapped file (col. 18, lines 6-20).

Therefore, it would have been obvious to a person of ordinary skill in the art at the time the invention was made to combine the teachings of Soltis with the teachings of Duvall so as to have staring address of a mapped file and length of the file offset and a system having multiple of storage device and a plurality of processors for each operating system or file system in a UNIX operating system. The motivation being to have a multiple of storage devices having a plurality of UNIX based file systems for easing or more flexible for extending the data file and enabling to access the same copy of user data without the need for special operating systems.

With respect to claim 25, Soltis teaches the operating system being a UNG

based system (col. 5, lines 5-60).

Contact Information

8.   Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Anh Ly whose telephone number is 703 306-4527 or via

E-Mail: ANH.LY@USPTO.GOV. The examiner can normally be reached on 7:30 AM -

4:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, John Breene, can be reached on 703 305-9790. The fax phone number for

the organization where this application or proceeding is assigned is 703 746-7239.

Any response to this action should be mailed to:

Commissioner of Patents and Trademarks

Washington, D.C. 20231

or faxed to: Central Office (703) 872-9306 (Central Official Fax Number)

Hand-delivered responses should be brought to Crystal Park II, 2121 Crystal

Drive, Arlington, VA, Fourth Floor (receptionist).

Any inquiry of a general nature or relating to the status of this application or

proceeding should be directed to the receptionist whose telephone number is 703 308-

6606 or 703 305-3900.

JEAN M. CORRIELUS
PRIMARY EXAMINER

ANH LY
JUN. 22nd, 2004